Headquarters U.S. Air Force

Integrity - Service - Excellence

AF UAS Flight Plan 2009-2047

Colonel Eric Mathewson
AF UAS Task Force

U.S. AIR FORCE

U.S. AIR FORCE

Assumptions

- Manned and unmanned systems must be integrated to increase capability across the full range of military operations for the Joint Force
- UAS compelling where the human is a limitation to mission success
- Automation is key to increasing effects, while potentially reducing cost, forward footprint and risk
- The desired effect is a product of the “integrated system” (payload, network, and PED); and less the particular platform (truck)
- Modular systems with standardized interfaces enhance adaptability, sustainability and reduce cost
- Robust, agile, redundant C2 enables supervisory control (“man on the loop”)
- DOTMLPF-P solutions are linked and must be synchronized

U.S. AIR FORCE

Autonomy

Conventional Harbor

- 4 operators per crane
- Manpower-centric system
  - Legacy system
  - Manpower dependant
  - Manual Operation

"Multi-Crane Control"

- 1 operator per 6 cranes
  - 24x increase in efficiency
- Tech-centric system
  - Multi-crane Control
  - Automation (cranes and AGV)
    - DGPS
    - Algorithms

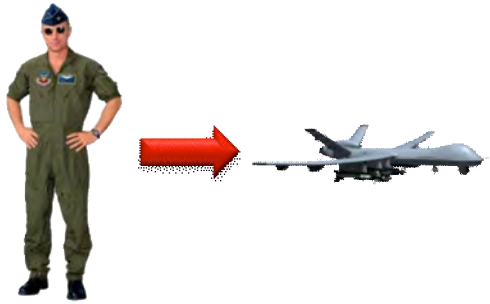
U.S. AIR FORCE

Autonomy – Multi-Aircraft Control Potential Manpower Savings

2011
(Current system)

- 50 CAPs
  - 50 MQ-9 CAPs
  - + 7 a/c in constant transit
- 10 pilots per CAP
  - 500 pilots required
  - + 70 pilots to transit a/c

570 Total Pilots

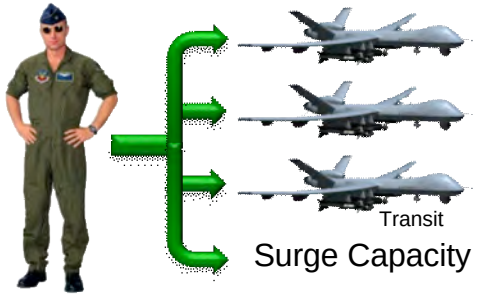


2012
(MAC)

- 50 CAPs
  - 50 MQ-9 CAPs
  - 2 CAPs per MAC GCS
  - 1 transit per MAC GCS
- 5 pilots per CAP
  - 250 Pilots required
  - + 0 to transit aircraft

250 Total Pilots

56% Manpower Savings



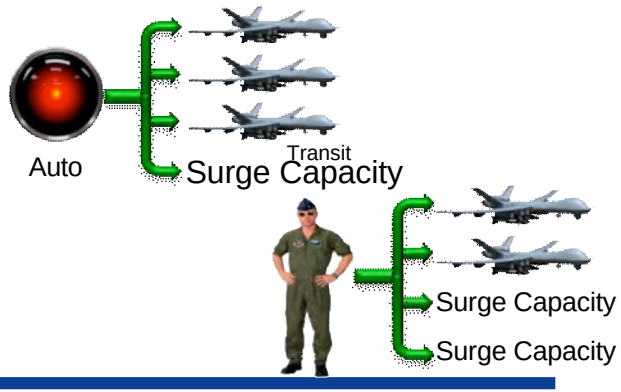
MAC = 1 pilot can fly up to 4 a/c

TBD
(MAC + 50% auto)

- 50 CAPs
  - 50 MQ-9 CAPs on orbit
- 25 CAPs automated
- 25 CAPs in MAC (5 pilots/CAP)
  - 125 pilots required
  - + 25 auto-msn monitor pilots
  - + 0 to transit aircraft

150 Total Pilots

64% Manpower Savings



U.S. AIR FORCE

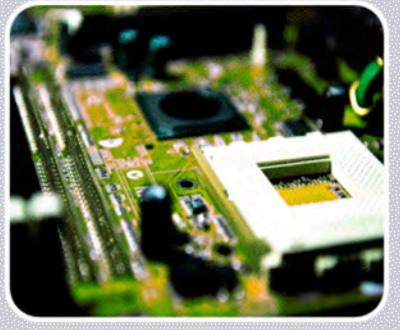
Modularity

Effective

B-52

- Standard Interfaces
- Variable / Tailorable armament set
- JFC Mission Flexibility
  - Conventional/nuclear
  - Stand-off strike, CAS

Affordable



PCs

- Standard interface/bus
- Swappable components
- Promotes vender competition
- Drives down price, improves quality, allows for tailorability
- $399 PCs are reality

Flexible

C-130

- One platform/truck
- Supports multiple missions
- Swappable modules

AMC-X CONCEPT CAPABILITIES STUDY

Common components, similar shape, and same production line

Enabling the "Global" in "Global Vigilance, Reach and Power!"

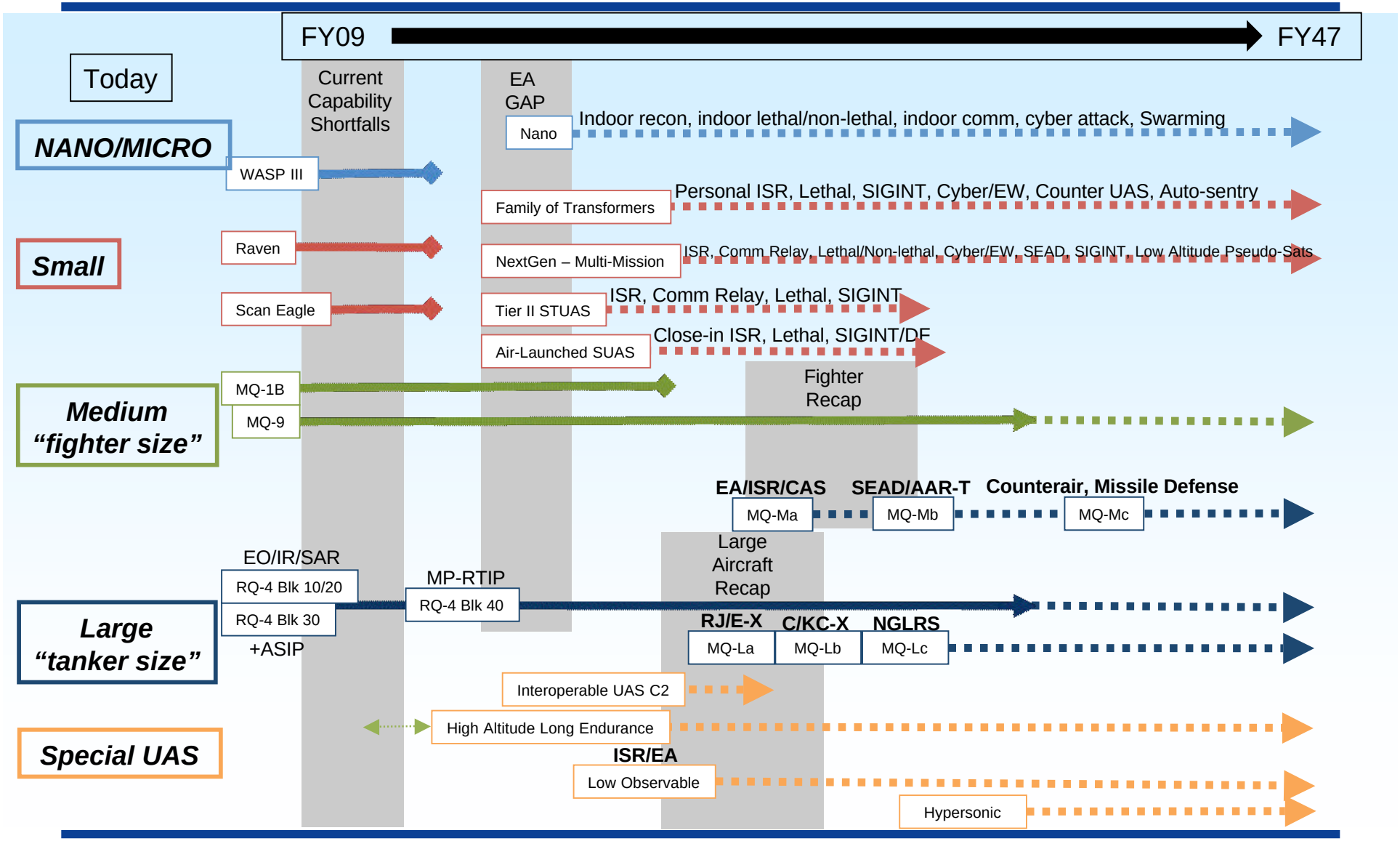
U.S. AIR FORCE

How do we get there?

- Methodology
  - Identified where we are today
  - Examined future scenarios and desired capabilities
  - From that future perspective identified actions to get there from today
  - Matched compelling requirements to UAS capabilities aligned with AF Core Functions
  - Identified and sequenced actions addressing not only materiel solutions, but also the doctrine, organization, training, facilities and policy

U.S. AIR FORCE

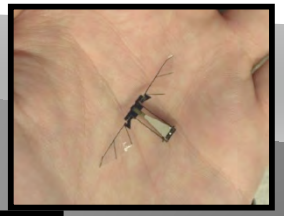
AF UAS Flight Plan:
Mission sets for UAS



U.S. AIR FORCE

SUAS "Family of Systems"

Nano
Navigate / communicate inside buildings



Nano

Bio-Mechanicals
- Indoor Reconnaissance
  - Indoor Lethal/Non-lethal
  - Indoor Comm
- Cyber attack
- Swarming

Micro
Close-in reconnaissance & situational awareness

Wasp III

"SUAS Family of Transformers"
- Personal ISR
  - Lethal
  - SIGINT
  - Cyber/EW
  - Counter-UAV
  - AutoSentries

Lite Machine's Conceptual SUAS

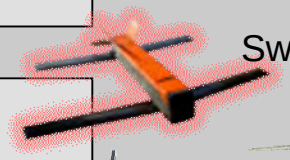
Irregular Warfare

Man-portable
- ISR
- Time-Sensitive
- Lethal

Raven B

Increasing across all mission sets

Switchblade SUAS
Technical Demonstration



Family of Expendables
- Close-In ISR
- Expendable Jammers
- Lethal
- Counter Air
- Precision Clandestine Resupply
- Cyber attack

Artist Conception Future AL-SUAS

Air-Launched
- Close-in ISR
- Lethal
- SIGINT/DF

Finder SUAS

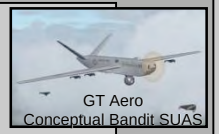
Anti-Access Support

Voyeur SUAS
Technical Demonstration

Multi-Mission
- ISR
- Force protection
- FID

Scan Eagle

Tier II Joint
- ISR
- Comm Relay
- Lethal
- SIGINT



GT Aero Conceptual Bandit SUAS

Next Gen Multi-Mission
- ISR
- Communications Relay
- Lethal / Non-lethal
- Electronic/Cyber Attack/SEAD
- SIGINT/Low Altitude Pseudo-Sats
- = New Mission areas

Now → **Future**

U.S. AIR FORCE

Medium "System"

MQ-1
- Collection – SIGINT/FMV
- CAS

MQ-9
- Collection – SIGINT/FMV
- CAS

MQ-Xa

MQ-9
- Collection
  - SIGINT/FMV
  - Wide Area Airborne ISR
  - SAR/GMTI
- CAS

Modular Payloads
- EW
- ISR
- CAS
- Comm Relay
- Collection
- Dissemination
- Specialized ISR
- AAR-R

MQ-Xb

Modular Payloads
- EW/ISR
- CAS
- Comm Relay
- Collection
- Dissemination
- Specialized ISR
- AAR-R&T
- SEAD
- Air Interdiction
- Counter Air
- CSAR
- Missile Defense
- Strategic Attack

MQ-Xc

Modular Payloads
- EW
- ISR
- CAS
- Comm Relay
- Collection
- Dissemination
- Specialized ISR
- AAR-T
- SEAD
- Air Interdiction
- Aeromedical Evacuation
- Personnel Recovery

Now → **Future**

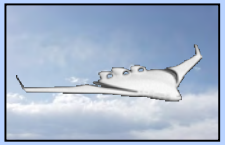
U.S. AIR FORCE

Large "System"

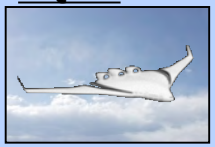
RQ-4 (Blk10)
- Collection – ISR
  - Basic SAR
  - Basic EO/IR

RQ-4 (Blk 20/30/40)
- **Collection:**
- *Block 20*
  - Enh SAR
  - Enh EO/IR
- *Block 30*
  - Adv SIGINT
- *Block 40*
  - MP-RTIP Radar
  - GMTI and concurrent SAR
  - High Range Resolution
  - No EO/IR or SIGINT

MQ-La



MQ-Lb



MQ-Lc

Modular Payloads
- EW
- ISR
- Command and Control
- Airborne Moving Target Indicator
- Ground Moving Target Indicator
- Information Integration
- AAR-R

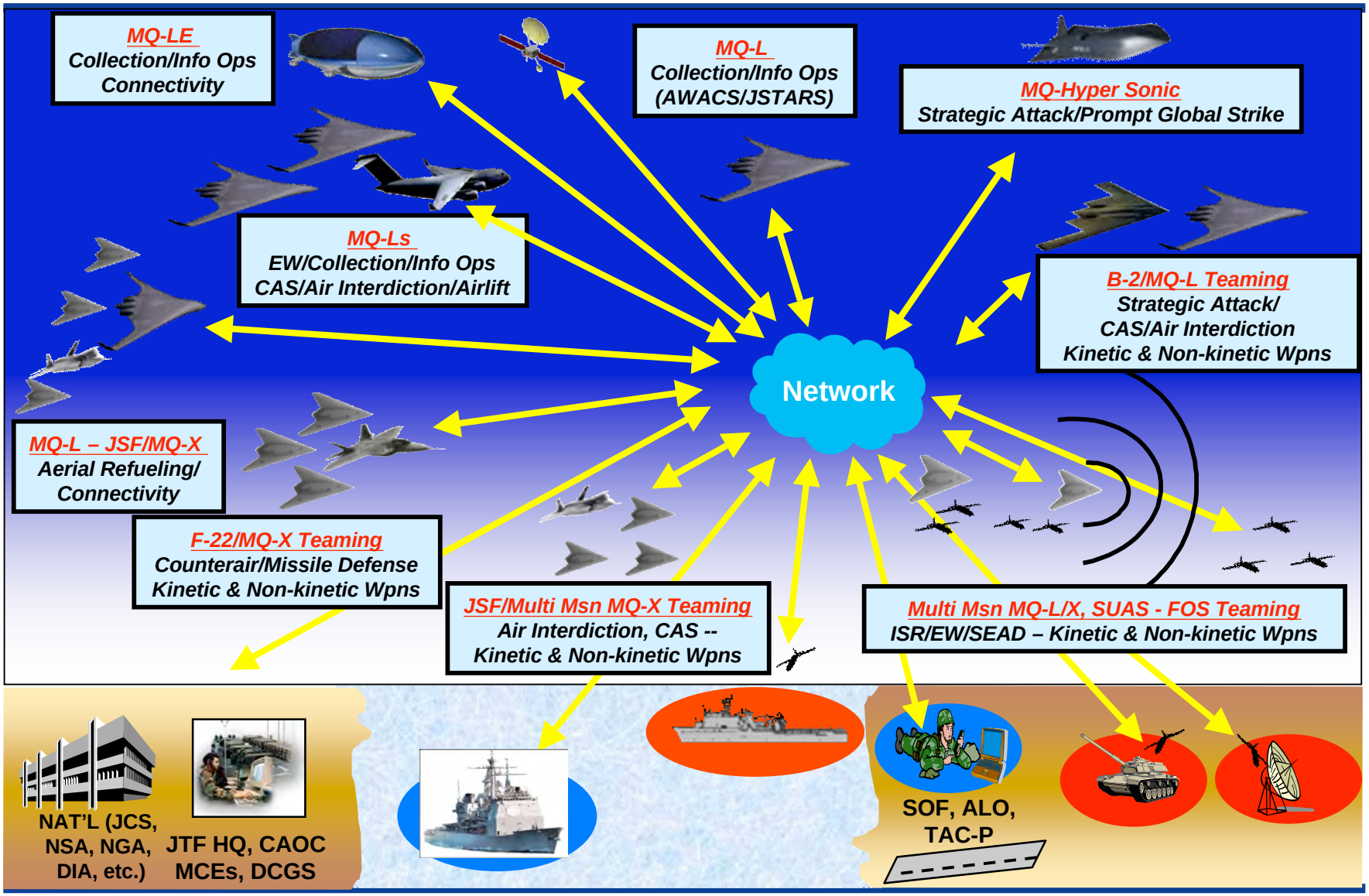
Modular Payloads
- EW
- ISR
- Command and Control
- Airborne Moving Target Indicator
- Ground Moving Target Indicator
- Information Integration
- AAR-R & T
- Airlift
- Humanitarian Assistance

Modular Payloads
- EW
- ISR
- Command and Control
- Airborne Moving Target Indicator
- Ground Moving Target Indicator
- Information Integration
- AAR-R & T
- Airlift
- Humanitarian Assistance
- Strategic Attack
- Global Strike
- CAS
- Air Mobility
- Airlift

Now → Future

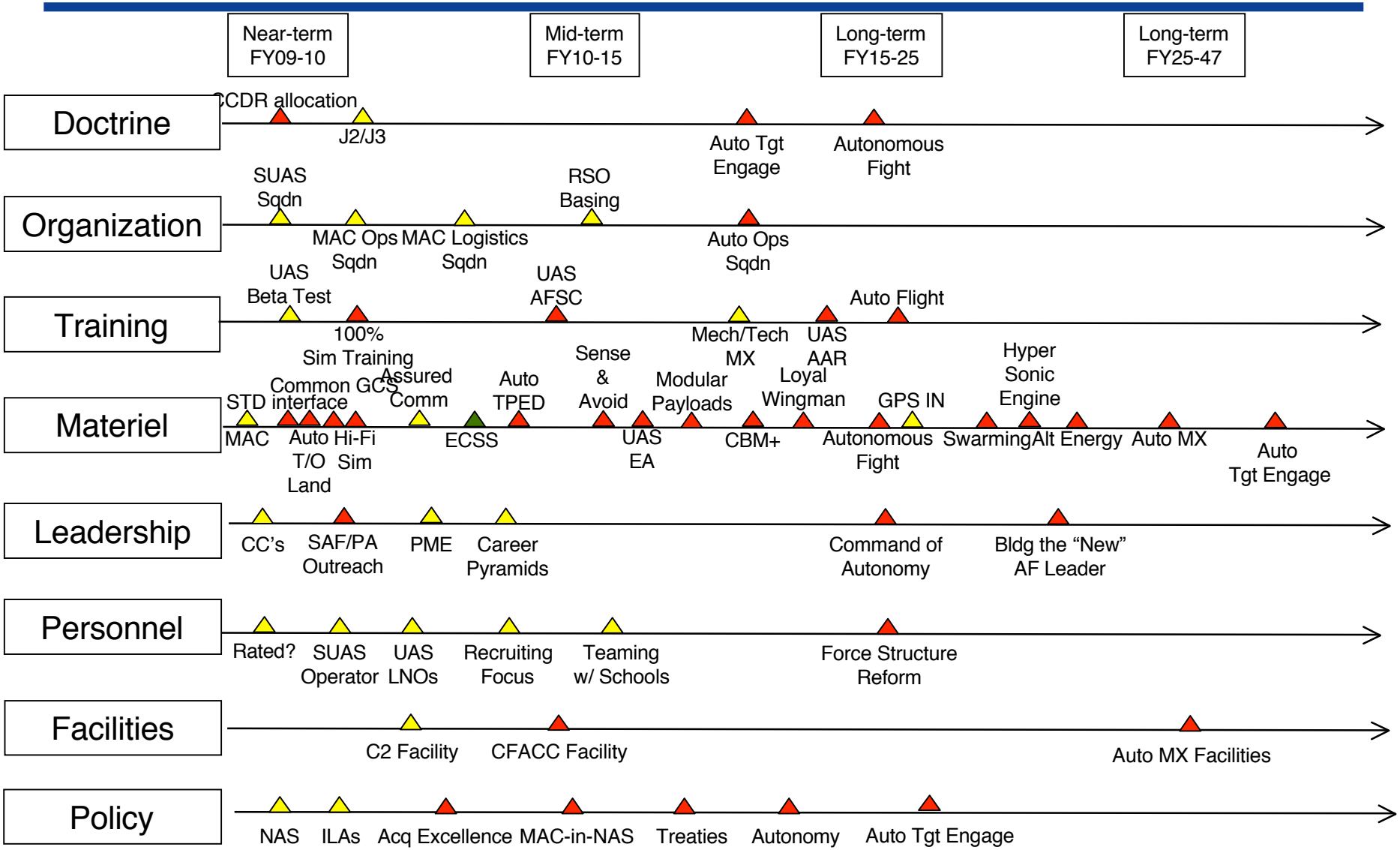
U.S. AIR FORCE

Connectivity and Teaming
Future



U.S. AIR FORCE

Action Synchronization



U.S. AIR FORCE

AF UAS Flight Plan Vision

- An Air Force where unmanned aircraft systems are considered as viable alternatives to traditionally manned platforms
- An Air Force that harnesses increasingly automated, modular and sustainable systems resulting in a leaner, more adaptable, tailorable, and efficient force that maximizes combat capabilities to the Joint Force
- An Air Force that teams with the other Services, our allies, academia and industry to capitalize on the unique unmanned aircraft attributes of persistence, connectivity, flexibility, autonomy, and efficiency